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created between two adjacent bottles 3 when the foremost bottle of the two passes over the apical edge 5b. The arrangement facilitates the introduction of the spacing sheets 8 without damage to the bottle labels. The protuberance may be formed by a replaceable track insert 5. In a modification, the protuberance is defined by two hinged portions, the height of the interconnection of which is adjustable to permit variations of the height of the protuberance.

(54) Packaging apparatus having means for inserting spacer sheets between articles

(57) In a packaging apparatus in which groups of bottles 3 arranged in a row and disposed upright on a guide track 1 are moved therealong by drive elements 2a of a travelling conveyor 2, the guide track incorporates a protuberance 5a in the form of a ridge having an apical edge 5b located below a device 7 for inserting a spacing sheet 8 into the wedge-shaped gap 6 which is

Fig.1

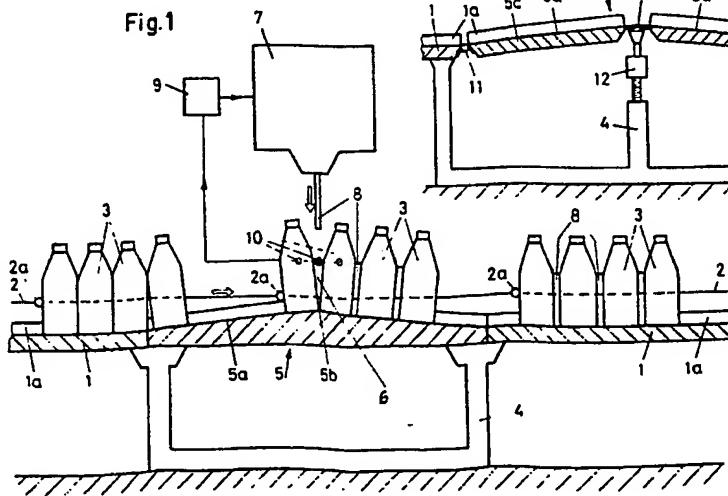
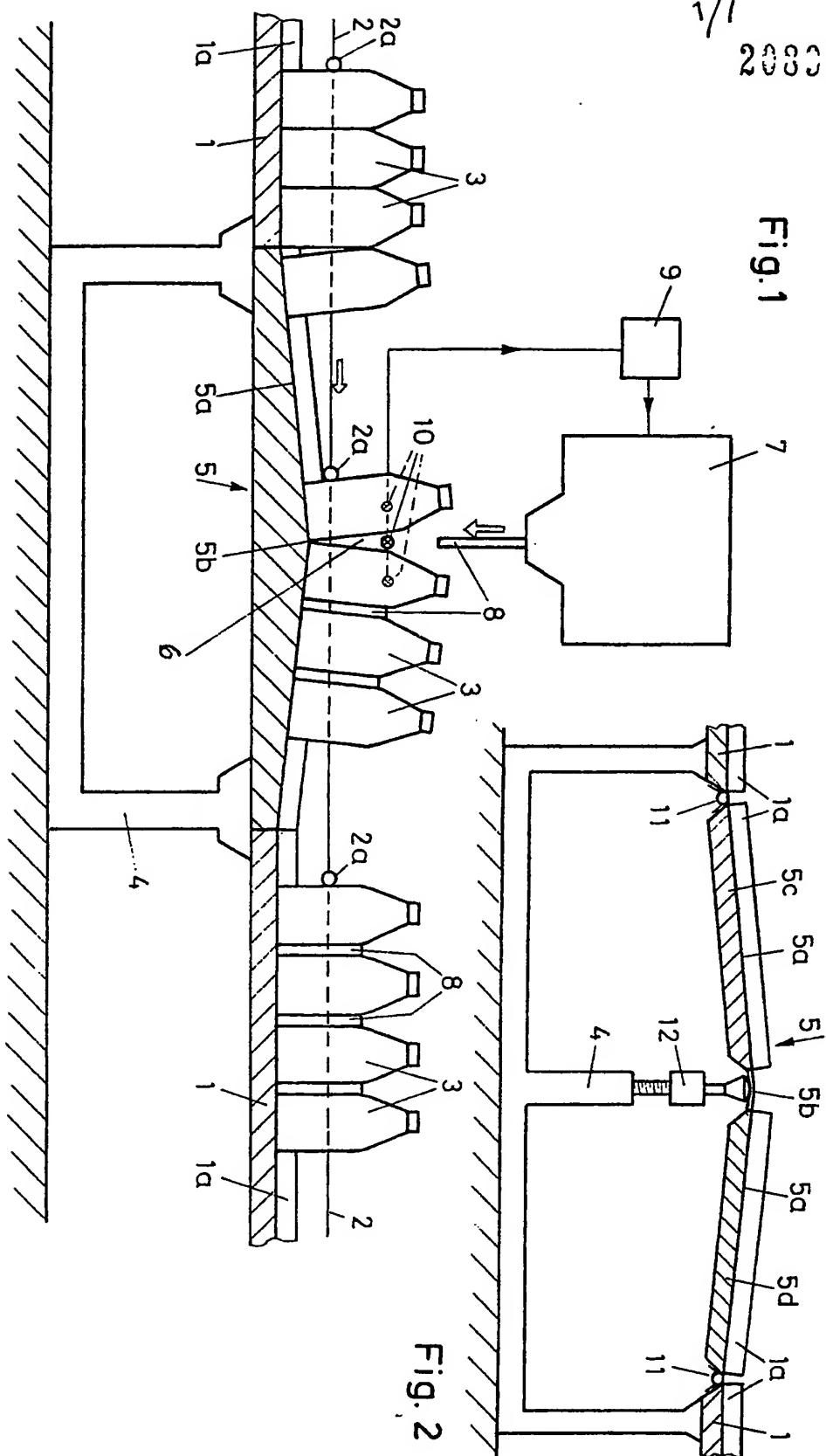


Fig. 2

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SPECIFICATION**Improvements relating to packaging**

5 This invention relates to packaging apparatus.

In bundling systems, particularly cardboard packaging means in which a plurality of bottles are arranged upright in a row and/or side-by-side, spacers are advantageously introduced, these being in the form of intermediate pieces of cardboard etc., which prevent direct contact between the individual bottles. Thus, clattering and rubbing of the bottle walls against each other are prevented during transport. This also prevents damage to the labels and reduces the risk of breakage of the glass.

Machines are commercially available which introduce, between bottles moving in a row on a conveyor track, intermediate pieces of cardboard to dispose them transversely of the conveying direction. If the conveyor track is so designed that a conveying element acts on the rear bottle of a complete group, the walls of the bottles are subjected to considerable force.

Introduction of the cardboard between each pair of adjacent bottles is often difficult and may lead to damage to the labels on the bottles and to the spacing sheets.

30 The present invention seeks to provide packaging apparatus in which spacing sheets can be introduced without great resistance while avoiding damage to the labels.

According to the invention, there is provided packaging apparatus having means for introducing spacing sheets, by means of an insertion device, between adjacent articles being packaged, which articles are arranged in a row and are moved on a conveyor means with their bases resting on a guide track, the side walls of the articles being at least partially in contact with each other, wherein a ridge-shaped protuberance 5a defining an apical edge over which the articles pass is fitted in the guide track 1 and wherein the insertion device 7 is arranged vertically above said apical edge 5b, the arrangement being such that, as bottles pass over said edge, a spacing sheet is introduced into the space between adjacent articles. When the articles, e.g. bottles, are moved over the apical edge of the ridge-shaped protuberance, a wedge-shaped gap is briefly created between the side walls of adjacent articles, into which gap the spacing sheets can be introduced without resistance. Thus, damage to the labels on the articles is prevented, and spacing sheets of low strength can be used.

Expediently, the ridge-shaped protuberance 60 is designed as a replaceable part or its height can be adjusted.

In order that the invention may be better understood, an embodiment thereof will now be described by way of example only and with reference to the accompanying drawings in

which:-

Figure 1 is a diagrammatic side view of an embodiment of the apparatus of the invention, and

70 Figure 2 is a modified form of the Fig. 1 apparatus.

Referring to the drawings, groups of, for example, four articles 3, e.g. bottles, arranged in a row are moved on a guide track 1 of fixed location and having lateral guide rails 1a, by means of a circulating endless conveyor means 2 equipped with spaced drive elements 2a. Since each drive element 2a acts on the rear article of a respective group,

80 the side walls of adjacent articles in each group are in contact with each other.

Arranged in the zone of the guide track 1 and on a frame 4 is an insert 5, the surface of which forms a ridge-like protuberance 5a in the guide track, which protuberance has an apical edge 5b at the middle. This edge may be sharp or slightly rounded. Beyond the insert 5, the guide track 1 becomes flat again. The result of the presence of the ridge-shaped 90 protuberance is that the articles 3, standing on the ascending part of the protuberance, are backwardly inclined in the conveying direction, whereas the articles standing on the descending part of the protuberance are forwardly inclined. Thus, a wedge-shaped gap 6 is created between two adjacent articles 3, disposed one on each side of the apical edge 5b.

Arranged vertically above the apical edge 100 5b is an automatic insertion means 7 known *per se* which introduces a spacing sheet 8, e.g. a piece of cardboard, into the gap 6 at each moment when, as illustrated in Fig. 1, one article is positioned at one side of the apical edge 5b and another at the other side thereof. The spacing sheet is then clamped between the two adjacent articles 3 as soon as the two articles have moved on to the descending part of the protuberance 5a. The 110 groups of articles, provided with spacing sheets 8, are then moved onwards to a further processing station.

The signal for initiating the insertion of a spacing sheet 8 is sent to the insertion means 115 7 by an electronic control unit 9, known *per se*, which is actuated, for example, by sensors 10, known *per se*, for example light barriers or capacitive barriers which in turn are actuated by the articles 3 or by parts of the 120 conveying means 2.

The insert 5 is removable and can be replaced by other inserts having greater or smaller degrees of slope in the ridge-like protuberance 5a.

125 Fig. 2 illustrates a modified form of the ridge-shaped protuberance 5a forming part of the guide track 1. Here, the insert 5 is formed by two portions 5c and 5d which are connected by hinges 11 to the guide track 1. A 130 resiliently extensible part is arranged on the

apical edge 5b. The height of the ridge-shaped protuberance can then be varied by means of an adjusting device 12, e.g. a nut mounted on a screw-threaded spindle in order 5 to vary the slope of the protuberance 5a.

CLAIMS

1. Packaging apparatus having means for introducing spacing sheets, by means of an insertion device, between adjacent articles being packaged, which articles are arranged in a row and are moved on a conveyor means with their bases resting on a guide track, the side walls of the articles being at least partially in contact with each other, wherein a ridge-shaped protuberance 5a defining an apical edge over which the articles pass is fitted in the guide track 1 and wherein the insertion device 7 is arranged vertically above said apical edge 5b, the arrangement being such that as bottles pass over said edge, a spacing sheet is introduced into the space between adjacent articles.
2. Apparatus according to claim 1, wherein the ridge-shaped protuberance 5a is designed as a replaceable part 5.
3. Apparatus according to either one of claims 1 or 2 wherein the height of the ridge-shaped protuberance 5a is adjustable.
4. Packaging apparatus substantially as hereinbefore described with reference to the accompanying drawings.

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